Abstracts

Fiber-optic millimeter-wave uplink system incorporating remotely fed 60-GHz-band optical pilot tone

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This paper proposes a fiber-optic millimeter-wave (mm-wave) uplink system incorporating a 60-GHz-band photonic downconversion technique. With this concept, neither a light source nor a MM-wave source is required at a base station (BS) since the MM-wave modulated optical pilot tone is fed from a remote central station (CS). In the BS, a high-speed MM-wave electroabsorption modulator and a subsequent optical bandpass filter are used for the photonic downconversion of the received MM-wave signal, converting the 59.6 GHz MM-wave signal into a 2.6 GHz intermediate frequency (IF) signal. The converted signal is then transmitted through the uplink fiber system to the CS with no significant chromatic dispersion effect. We successfully demonstrated not only photonic downconversion, but also 50 km long fiber-optic transmission of the downconverted 2.6 GHz IF signal with 156 Mb/s of data.

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